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ABSTRACT

Mount Vernon's Title III Project, a K-12 program in environmental education, is a three-year (1971-1973) project with the following objectives: to train teachers to write and implement "in-the-classroom" learning packages in environmental education; to institute a locally-validated K-12 curriculum in environmental education, consisting of a sequence of learning activity packages; and to establish an operational and fully tested resource center for environmental education. The present document is a preliminary report on the development and operation of the project. A pilot study is also reported on teachers and students using "Learning Activity Packages" developed through the project. Further evaluation will be forthcoming. This work was prepared under an ESEA Title III contract. (JP)

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MOUNT VERNON SCHOOL DISTRICT NO. 320

TITLE III ESEA PROJECT

ENVIRONMENTAL STUDIES

Preliminary Evaluation Report
Elizabeth O. Pearson
June 21, 1973

SE 016 951

Pilot Program Objectives

A pilot program to test out LAP materials was conducted from April 1 to June 1, 1973, with teachers from grades 1 through high school. The pilot program had 3 major objectives. First of all, it was necessary to determine whether or not LAPs could be used by those teachers who had not written LAPs and who had no training in the writing of LAPs. Secondly, the pilot program was lunched to determine whether the use of LAPs over a two month time period would increase student knowledge about the environment. A third objective was to refine LAPs after they had been used in the classroom.

All participants in the pilot met for a workshop March 16 to learn about the purposes of the pilot and the procedures. The pilot officially began the 1st of April and ended June 1. Teachers were instructed to use LAPs in any way they would fit into the classroom curriculum and activities. Communication between participants was allowed but not encouraged.

This report will deal with the first two objectives of the pilot program: determining feasibility of teacher usage, and testing for change in student knowledge.

Questions for Evaluation

The following questions were the focus for the statistical evaluation of the pilot.

Student Knowledge

Would the use of LAPs produce any change in student knowledge about the environment as measured by a knowledge test. Would those student who were taught by teachers who had written LAPs learn more than those who were not taught by teachers who had written LAPs.

Teacher Attitude

Would those teachers who had written LAPs have a more positive attitude toward the use of LAPs than those teachers who had not written LAPs and had had no training in doing so.

Teacher Attitude - Student Knowledge

What is the correlation between teacher attitude and student knowledge difference scores for teachers and classes with teachers who have and have not written LAPs.

Teacher Attitude - Student Attitude

What is the correlation Between teacher attitude difference scores and student attitude scores for teachers and classes with teachers who have and have not written LAPs.

Student Attitude - Number of LAPs per Student

What is the correlation between student attitude scores and number of LAPs per student per class.

Student Knowledge - Number of LAPs per Student

What is the correlation between student knowledge gain scores and number of LAPs per student per class.

Procedure

Sample

A pair of teachers in each grade from 1 through 6, a pair in parallel subjects in 7th and 8th grade and 5 pairs in parallel subjects at the high school level participated in the field testing of materials

Teachers who had written LAPs were asked to participate in the pilot program. Those teachers were asked to find a counterpart at their grade level or in their subject (middle and high school only) who had not written or had any training in writing LAPs*.

*Teachers who had written LAPs are designated the experimental group

All teachers were from the Mount Vernon School District except 3 persons. One middle school participant in the control group was from Cascade Junior High, Sedro Woolley, and one participant in the experimental and one in the control group for the middle school were from Immaculate Conception School.

Test Instruments

A knowledge test which was developed in 1972 based on the environmental principles identified by the Project was used to pre and post test students in the participant and non-participant groups. Two forms of the same test were developed for each level: primary, intermediate, middle school and high school.

An attitude questionnaire was developed for evaluation of student feelings about LAPs. It focused on student perceptions of the importance of environmental education, LAPs as amethod of individualized instruction and student perceptions of their teacher's feelings about LAPs. Five responses ranging from strongly agree to strongly disagree were possible for each statement.

A third questionnaire for teachers was prepared to assess teachers' feelings about LAPs. Teachers responded to statements on a scale of 1-5, from strongly agree to strongly disagree on the development and use of LAPs, LAP fromat, and student interest in LAPs. Teachers' perceptions of the Center for Environmental Studies and environmental education in general were measured by their response to 9 polar words describing the Center and environmental education. The questionnaire consisted of a total of 30 items.

Testing Procedure

Teachers responded to the attitude questionnaire at the beginning of the workshop on March 16, 1973. The parallel form of the questionnaire was taken by teachers during the last week of the pilot before the knowledge tests and attitude questionnaires were administered to their students.

Students in all classes in the pilot took Form I of the knowledge test appropriate to their grade level on the first day of classes in April, 1973. Form II, the knowledge post test, was administered the last week of May, 1973.

Students also took the attitude questionnaire the last week in May. All student testing was performed by the classroom teacher. No time limit was set on any of the testing. Primary students used specially prepared answer sheets in both the knowledge and attitude test. Those responses were then transferred to IBM answer sheets. Teachers of primary students were instructed to read the questions to their students while students at all other grade levels were to do their own reading of test questions.

Other Methods of Evaluation

Along with the testing procedure, teachers were given a sheet entitled Student Record of LAPs Completed. Each time a student completed a LAP, the LAP number was recorded on the sheet. In this way we determined how many LAPs were completed per student in each class.

Teachers were also asked to keep a record of changes to made in LAPs which were used by students in their class. Those records were used to make the necessary refinements in the LAPs.

Analysis of the Data

Test data will be analyzed in the following ways. An analysis of variance will be used to determine whether there is any statistical significance in the knowledge scores for experimental and control groups.

The teacher attitude questionnaire total scores and subscores will be tested for significance by a test.

Teacher attitude difference scores will be analyzed with student knowledge difference scores and student attitude scores by rank order correlation.

The mean number of LAPs /student/ class will be correlated with student knowledge difference scores and student attitudes scores.

Preliminary Findings

On the basis of class means for student knowledge pre and post tests and student attitude questionnaires, the following statements can be made. In all four groups; primary, intermediate, middle school and high school, the largest mean difference between knowledge pre and post tests was ±1.80 for the middle school experimental group. The lowest positive mean difference (+.22) was for the intermediate experimental group. Both high school experimental and intermediate control groups had small negative mean differences. There does not seem to be a general pattern of significant improvement between knowledge pre and post tests of all groups. Likewise, there seems to be no significant pattern of improvement for experimental over control groups at any of the 4 levels. In the high school control group , one teacher #Data analysis is now under way and not yet complete- provided no knowledge or attitude tests from his students. Another high school teacher provided no knowledge pre tests.

The student attitude questionnaires appear to show a trend from primary to high school. Primay and intermediate groups show attitude means progressing from 2.20 to 2.57. Middle school and high school means range from 2.29 to 2.84. It would appear that the primary and intermediate

groups had a lightly more favorable attitude toward LAPs than the middle school and high school. Over all groups, it seems that attitudes toward LAPs range from agree to not sure but there seems to be no indication of dislike for LAPs.

Teacher attitude scores are not yet available nor are all Records of Student LAPs Completed. A complete report of findings will be made on completion of the data analysis.

CENTER FOR ENVIRONMENTAL STUDIES
ESEA TITLE III PROJECT #29-320-71-430
MOUNT VERNON SCHOOL DISTRICT NO. 320
1219 East Division Street
Mount Vernon, [illegible]ington 98273
February [illegible], 1972

by Partick T. Hayden

NARRATIVE, GOALS, PROCEDURES

Mount Vernon's Title III Project, a K-12 program in environmental education, has as a target population the K-12 student body of Mount Vernon School District, and (over the three-year period) involves directly 100 District teachers, and indirectly involves most of the remaining District staff of 170 teachers. At the end of the three-year period of federal assistance, the Mount Vernon School District expects to have

1. One hundred teachers trained in writing and implementing in the classroom learning packages in environmental education.
2. A locally validated K-12 curriculum in environmental education, consisting of a sequence of learning activity packages.
3. An operating and fully tested resource center for environmental education. (Center for Environmental Studies.)

The Project is directed toward national, State, and local needs. Nationally, the President of the United States, the United States Office of Education, and the National Education Association have all established the priority for environmental education. On the State level, the Governor, the State Department of Education, and the Washington Education Association have similarly stressed the need for effective educational programs in environmental education. Locally, the District was without an environmental education curriculum, and specific staff and student needs included: instructional programs stressing individual progress toward educational

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objectives, increased skills in determining instructional objectives and evaluating progress toward those objectives; better utilization of instructional supplies and materials and human resources in relation to instructional objectives; the acquisition by students of a value system with regard to the environment, and the knowledge and skills necessary for acting upon those values, now and as adult citizens.

In-Service Training of Staff: The training component of the Project consists of two phases: the "pilot," and the "major" phase. The pilot in-service extended from the first funding of the Project (January, 1971) to June, 1971, and involved 25 teachers. This phase provided a "trial run" prior to the major in-service. The pilot in-service was subcontracted to Edcodyne Corporation, of Orange, California, on a modified performance contract. The original Project design called for the gradual withdrawal of Edcodyne from the Project over the three-year funding period, and parallel local assumption of the training role. On the basis of the pilot in-service, local expertise was identified and developed, and Project personnel assumed responsibility for the design and management of the training model at the conclusion of the pilot in-service. The major in-service is the immediate responsibility of a Project Coordinator of Training and LAP Production, and while "outside" consultants are called in as necessary, Edcodyne is no longer involved with the Project. The major in-service involves 50 District teachers; it extends from August, 1971, to June, 1972, and will continue from August, 1972, through June, 1973, for an additional 25 District teachers. Each participant is responsible

In-Service Training of Staff: (Continued)

for writing, testing out in the classroom, and modifying as necessary a minimum of one learning package in environmental education, consistent with Project criteria. Most participants complete several LAPs in environmental education.

K-12 Sequence of LAPs in Environmental Education: The training of staff in the production and implementation of LAPs in environmental education is a step in the development and testing of a K-12 curriculum in environmental education, consisting of a sequence of LAPs. An early commitment was made to an inter-disciplinary approach to environmental education. Teachers participating in the Project represent all grades, and a wide range of secondary subject areas. LAPs are directed toward environmental education objectives appropriate to the educational levels of the students, and within the framework of the existing curriculum. Thus, a secondary science teacher will develop LAPs for meeting valid environmental education objectives within the scope of his science class, and a grade six teacher might develop a LAP for sixth graders that will be a part of a social studies unit, but aimed at environmental education objectives.

One of the first Project tasks was to identify a sequence of "valid" environmental education objectives.

One of the first Project tasks was to identify a sequence of "valid" environmental education objectives, or, more accurately, to design a procedure that would lead to a valid sequence. The procedure of necessity had to be consistent with the "instructional systems" approach inherent in the LAPs. The first step was to research work already completed

K-12 Sequence of LAPs in Environmental Education: (Continued)

that might appropriately be incorporated into the Project. This led Project personnel to the work of the University of Wisconsin at Madison. (U.S. Office of Education Center No. C-03, Contract OE 5-10-154.) Wisconsin had published and validated a list of 121 environmental concepts. Validation consisted of subjecting the concepts to the cumulative judgment of scientists, scholars, educators, agricultural specialists, environmentalists, and others who by virtue of their training and experiences qualified as "experts" in the field of environment. Using these concepts as a starting point, Project personnel compiled 20 broad concepts that formed the base from which specific LAP objectives were derived. These 20 concepts grew out of the work of a local "validation committee" representing logging, agriculture, environmental organizations, the State Department of Natural Resources, and other area business and industry.

All LAP objectives are derived from the 20 Project concepts (re-named principles, consistent with Project terminology). These principles are broad, and each is capable of generating objectives in environmental education within the framework of the existing curriculum. However, it became clear that this operational definition of an environmental education LAP ("...must rise out of one of the principles...") was too broad. LAPs were being developed that met Project requirements for environmental LAPs, but which might more properly be viewed as English, history, or science LAPs. To further refine the Project's definition of an environmental education LAP, it was determined that each LAP, in addition to meeting the criteria

K-12 Sequence of LAPs in Environmental Education: (Continued) described above, must be consistent with the Project's defintion of environmental education. The Project had previously adopted the defintion of environmental education found in Public Law 91-516--The Environmental Education Act: "The educational process dealing with man's relationship with his natural and man-made surroundings, and including the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, and urban and rural planning to the total human environment." This requirement further focused the Project's LAPs on legitimate environmental areas of study, within the framework of the existing curriculum.

At the completion of the 1971-72 in-service in June 1972, Project personnel, with outside consultation as required, will select and assemble LAPs representing a K-12 sequence in environmental education. Related Project products will be a scope and sequence chart listing principles, objectives, and learning activities by grade and subject areas, cross-referenced to appropriate LAPs. During the remainder of the Project, the individual LAPs will be validated in the classroom, and LAP and sequence revisions will be made on the basis of the classroom trials.

Resource Center for Environmental Education: (Center for Environmental Studies) From earlier District experience in other instructional areas, it was assumed that instructional objectives in environmental education could be attained most effectively if a "resource center" were created to serve

Resource Center for Environmental Education: (Continued)

teachers and students. The Center was conceived as a supporting facility and service, providing the equipment, supplies, and materials, as well as human resources required by both teachers and students as they work toward Project and LAP objectives.

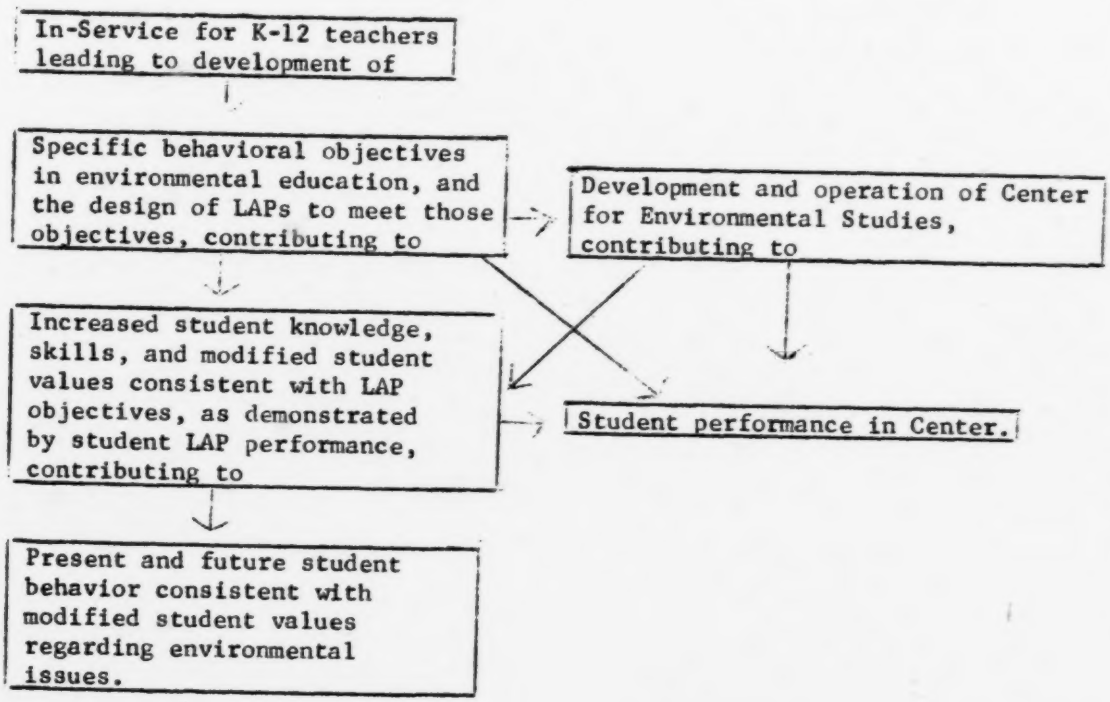
The Center is staffed by a full-time Center Coordinator, assisted by two half-time secretaries, one of whom also serves as Project secretary, assisting the Project Director in the preparation of Project budgets, reports, and maintenance of Project records.

The Center was created by remodelling a locker room area at Mount Vernon High School, at an initial cost of $12,000. It was stocked and equipped through Project funds, and through a Title II Special Needs Grant of $5,000. It serves as a study and research area for students, individually and in small groups; it is utilized by the District's staff as a small group instructional area for environmental education; the Center Coordinator manages the supplies and equipment and coordinates their use District-wide as teachers and students work toward environmental education objectives. Additionally, the Center Coordinator serves as an environmental education resource to the District's students and teachers.

OBJECTIVES

Specific Project student objectives are products of and part of the individual LAPs; the LAPs provide the means for determining and the instrument for achieving these objectives, as well as the means and instrument for evaluating student attainment of the objectives.

At this point in the Project timeline, specific student objectives can only be reviewed broadly. The Project's scheme for determining specific objectives can be presented as follows:


In-Service for K-12 teachers leading to development of
Specific behavioral objectives in environmental education, and the design of LAPs to meet those objectives, contributing to
Development and operation of Center for Environmental Studies, contributing to
Increased student knowledge, skills, and modified student values consistent with LAP objectives, as demonstrated by student LAP performance, contributing to
Student performance in Center.
Present and future student behavior consistent with modified student values regarding environmental issues.

PROJECT EVALUATION TO DATE

Two Project Evaluators--Dr. Sam Kelly and Gil Johnston, Western Washington State College, Bellingham, Washington--assist Project staff with evaluation design and implementation.

The evaluation design consists of two parts: (1) Continual monitoring of Project activities and outcomes in terms of major Project goals and the calendar established for achieving them. (2) Evaluation of Project products in terms of student change, and its relationship to Project objectives.

The first component of the evaluation design confirms that major Project objectives are being met "on target."

To date, 25 teachers have completed the pilot in-service; 43 are engaged in the major in-service. By January, 1972, 41 LAPs have been completed; 33 are in process.

The Center was operational in September, 1971, on schedule. In its 67 days of operation, 1,329 students were in the Center for environmental education activities. One hundred seven (107) staff members utilized the Center's services. Ninety-one (91) hours of Center resources were "exported" to other buildings in the District.

Significant measurement of attainment of student performance objectives through Project LAPs will occur as part of the local validation of the LAP sequence in 1972-73. However, some LAPs have been tested individually with the following results:

Number of LAPs	% of Students Meeting Acceptable LAP Performance Objectives
1	82%
1	86%
10	100%

To date, Project objectives have been met or surpassed, on or in advance of the Project timeline.